

## **A STUDY ON THE INFLUENCE OF SOCIAL PRESENCE ON CONSUMERS' PURCHASE INTENTION IN E-COMMERCE LIVE STREAMING**

**Zongxiao Huang<sup>1\*</sup>**

<sup>1</sup> Graduate School, Siam University

\* Corresponding Author, E-mail: 6517195028@qq.com

**Abstract:** This study introduces the sense of social presence to investigate the sense of reality and experience brought by the interactive environment (e-commerce broadcasting room) that consumers can perceive, as well as the influence of the significant degree of feeling the presence of others and communicating and interacting with them on consumers' Immersion experience and purchase intention. By constructing the influence mechanism of social presence in e-commerce live streaming, this study enriched the application of immersive experience and the need for cognitive closure theory in the context of e-commerce live streaming, provided new ideas for understanding consumer purchasing behavior in the context of e-commerce live streaming, and provided theoretical support for them to improve the level of social presence and need for cognitive closure to enhance consumers' purchase intention to achieve the expected sales target. At the same time, some suggestions are put forward for consumers to make rational purchases during live broadcast shopping, so as to help consumers avoid impulsive consumption or herd consumption. Based on the cognitive affective system theory and social facilitation theory, combined with relevant literature, this study introduced Immersion experience as the mediating variable and the need for cognitive closure as the moderating variable, constructed the research model of this paper, proposed the research hypothesis, and took the consumers who watched live e-commerce and went shopping as the research samples. In this study, literature analysis, questionnaire survey and empirical analysis were used as research methods, and 321 valid samples were collected by sending questionnaires, and SPSS and AMOS were used for empirical analysis. The following conclusions were drawn: Social presence positively affects Immersion experience and consumers' purchase intention; Immersion experience positively affects consumers' purchase intention; Immersion experience plays a mediating role in the influence of social presence on consumers' purchase intention; Need for cognitive closure plays a moderating role in the mechanism of the influence of Immersion experience on consumers' purchase intention. The positive relationship between Immersion experience and consumers' purchase intention is stronger in the case of high level of need for cognitive closure orientation than in the case of low level of need for cognitive closure orientation.

**Keywords:** Social Presence, Immersive Experience, Consumers' Purchase Intention, Need for Cognitive Closure

## **Introduction**

In 2016, Mushroom Street first introduced live streaming to e-commerce shopping. In the same year, large e-commerce giants such as Taobao and JD.com also added live streaming functions to their respective e-commerce platforms, and E-commerce LIVE gradually approached consumers. In 2018, the development of E-commerce LIVE gradually became systematic, penetrating into many industries and fields, and achieving large-scale growth. In 2019, many e-commerce platforms have opened live streaming functions. E-commerce LIVE has developed rapidly, and some Internet celebrity live streaming hosts have also become well-known network stars, ushering in the first year of E-commerce LIVE. At the end of 2019, the COVID-19 pandemic outbreak brought economic stagnation. Many merchants eventually closed down due to insufficient offline sales, and even the profits of the supported merchants were greatly reduced. However, during the epidemic prevention and control period, the e-commerce industry has released huge potential. Online shopping has facilitated consumers to shop to meet their daily needs, and it has also facilitated merchants to sell products, break down space barriers, broaden sales channels, and avoid product backlogs.

To a certain extent, it has eased the pressure on merchants caused by the epidemic outbreak and helped them resume work and production. It has also received attention from various industries and fields. In addition, when selling products or services through E-commerce LIVE, live streaming host often introduces product or service information in a variety of characteristic ways, and at the same time meets the dual needs of consumers for shopping and entertainment. E-commerce LIVE has gradually penetrated into consumers' lives and has become one of the main shopping methods for many consumers.

According to the data of China Internet Network Information Center, the national online retail sales in 2022 will be 13.79 trillion yuan. Among them, the cumulative number of live broadcasts on e-commerce platforms has exceeded 120 million, and the cumulative viewing has exceeded 1.10 trillion people. There are over 95 million live products, and nearly 1.10 million active live streaming hosts; the number of live broadcast users has increased from 703.37 million to 750.65 million, with a growth rate of 6.7%. Like traditional website shopping, the ultimate goal of E-commerce LIVE is to achieve the sale of products or services. However, at present, the barrier to entry for E-commerce LIVE is low, a large number of E-commerce LIVE platforms and live streaming hosts have emerged, and the types and content of live broadcasts are increasingly rich. There are also issues such as homogeneity, strong substitution, and intense competition. Consumers can choose more, and the cost of attention conversion is low. How to keep consumers in the live broadcast platform or live broadcast room and improve the

purchase rate and repurchase rate has become the focus of E-commerce LIVE platforms and live streaming hosts.

At the same time, E-commerce LIVE shopping is no longer a simple individual consumption, but a group, interactive, and social shopping behavior with "companionship" and "sharing" elements. E-commerce LIVE also involves a third-party LIVE platform other than buyers and sellers. Based on this paper, social presence is introduced to investigate the authenticity and experience brought by the interactive environment (E-commerce LIVE room) perceived by consumers, and the significant degree of feeling the presence of others and communicating with them affects consumers' Immersion experience and purchase intention. In addition, E-commerce LIVE shopping is a vaguer situation than offline shopping, with incomplete product display, asymmetric information between buyers and sellers, and consumers unable to truly feel the quality of the product. The product information obtained is less than offline, and the perceived follow-up services, such as logistics quality, returns and exchanges, are also uncertain. Based on this study, cognitive closure needs are introduced as a regulatory variable to investigate the impact of its high and low levels on consumers' purchase intentions.

### **Research Objective**

Based on the cognitive affective system theory and social facilitation theory, this paper introduces Immersion experience as a mediating variable, mainly explores the influence mechanism of social presence on consumers' purchase intention in the context of E-commerce LIVE and introduces the need for cognitive closure as a moderating variable between Immersion experience and consumers' purchase intention. The research objectives are as follows:

1. Study the impact of social presence on consumers' purchase intention from the perspective of E-commerce LIVE platform and live streaming host.
2. Explore how cognitive closure needs play a role between Immersion experience and consumers' purchase intention.
3. Put forward some suggestions for consumers to rationally buy during live shopping.

### **Literature Review**

#### ***Social Presence***

Social presence was first proposed by Short, Williams and Christie in 1976. The related theory of social presence describes the authenticity felt by individuals in the media and the significance of the existence of others. It points out that verbal or non-verbal cues in the media will prompt individuals to produce social presence, so that individuals can obtain a three-dimensional real sense of interaction in the media, and psychologically perceive the deeper connection between others and themselves. Scholars have different understandings of the concept of social presence in different fields and from different

angles. Biocca (2001) divided social presence into three dimensions: co-existence, psychological involvement and behavioral fit, and describes the connotation of social presence from these three aspects. Cyr (2007) and other scholars believed that social presence refers to the feeling that users feel as if they are engaging in interpersonal social interaction when using a website, and this social interaction can bring them warmth. Hassanein (2007) defined social presence as the psychological feeling of warmth and sociability conveyed by a website to users. Choi (2009) believes that social presence is a psychological perception generated by consumers when they shop online, which can reflect the psychological experience of consumers when shopping online. Lu (2012) believed that social presence is the emotional and cognitive consistency that consumers feel when they shop online, so that they can feel the consciousness of other consumers more strongly. Bulu (2012) and others argue that social presence has the characteristics of intimacy and directness. Therefore, when users use media to communicate, the medium itself will affect the intimacy between users, resulting in different levels of social presence. Eun et al. mentioned (2014) When studying online stores, he found that online shopping can also provide consumers with a sense of interpersonal interaction like shopping in offline physical stores. He defines social presence as a virtual shopping space that can be a sense of social reality, and a sense of scene generated by consumers.

Salinas (2005) and Fonner (2012) investigated the influence of different communication methods on social presence from different angles. The related research on social presence in the field of online education mainly focuses on students' participation, satisfaction and student performance. Gunawardena et al. (1997) defined social presence as students' perceptual experience when online learning; Tu (2000) pointed out that the social presence of virtual learning communities includes social situations, online communication and interactivity, so as to explore the relationship between social presence and online interaction; Kovanovic and Joksimovic et al. (2017), Molinillo (2018) pointed out that social presence can positively affect students' learning motivation and satisfaction, thereby improving learning performance.

### ***Immersion Experience***

Immersion experience was first proposed in 1975 by psychologist Csikszentmihalyi, who argued that Immersion experience describes when people are so engrossed in an activity that they don't care about other things. The experience is so enjoyable that people are willing to pay a huge price to achieve it. In 1989, Csikszentmihalyi & LeFevre pointed out that the connotation of Immersion experience includes "optimal experience" and "key components of happiness". This optimal experience immerses the individual and has great attraction to the individual. In order to maintain this happy state of immersion, the individual will invest more energy and participate in it. In 1997, Csikszentmihalyi conducted another study, in which he defined immersion as a state of psychological satisfaction in which an individual feels happy once immersed, fully immersing his attention in it, resulting in the

illusion of the passage of time. Satish (1994) defined immersion as a state of mental balance in which an individual engages in an activity that matches his abilities and produces a pleasurable experience.

On the basis of Csikszentmihalyi's proposal and research on Immersion experience, more scholars began to pay attention to Immersion experience and introduced Immersion experience to reading, sports, travel, network environment, online learning, e-commerce and other fields. In 1996, Hoffman and Novak began to use Immersion experience theory in the field of online network environment. They constructed a theoretical model of Immersion experience in the network environment. The research proved that Immersion experience can significantly affect users' learning effect, control perception, and exploration tendency. Subsequently, in 1999, Chenetal pointed out that Immersion experience in the network environment can significantly enhance users' dependence and satisfaction on the platform, and make users have an excellent experience. Research on Immersion experience in the field of Internet mainly focuses on user behavior patterns and other aspects. Huang (2003) believes that immersion theory is crucial to understanding network user behavior. Novak et al. (2000), Chen et al. (2000), Skadberg & Kimmel (2004), and Lin Xu (2018) all point out that users hope to maintain this state or reach a higher state after experiencing immersion, resulting in sustained network participation behavior. Research on the perfectors of Immersion experience has also accumulated certain research results, mainly focusing on perceived usefulness, perceived ease of use, and perceived control. Animesh et al. (2011) proved that meaningful social interaction can make people feel pleasant, which in turn produces Immersion experience. Wu (2015) believed that interactivity has a significant positive impact on Immersion experience. Xue and Xu (2016) have proved that usefulness, ease of use, etc. can significantly affect the generation of Immersion experience through research. Gao and Bai (2017) believed that the entertainment and effectiveness of perceived interaction will affect users' participation in online travel agencies, resulting in Immersion experience. Jiang (2020) believed that Immersion experience is different from addiction. It is a temporary psychological experience. Factors such as perceived enjoyment, perceived purpose, and perceived control are the precursors to Immersion experience. When individuals are in an immersion state, they will also experience a sense of time distortion and misperceive the speed of time passing. Koufaris (2002) divides Immersion experience into three dimensions: perceived controllability, perceived pleasure, and attentiveness. Hausman & Siekpe (2008) divide Immersion experience into four dimensions: challenge, perceptual control, perceptual enjoyment, and concentration. Guo & Poole (2009) believed that Immersion experience includes mental concentration, perceptual control, time distortion, fusion of action and consciousness, self-transcendence, and clear goals. Zamanetal. (2010) divided immersion experience into two dimensions: perceptual enjoyment and perceptual control. Xu et al. (2018) divided Immersion experience into perceptual enjoyment, perceptual practicality, perceptual control, attention concentration, and time distortion.

### ***Consumer Purchase Intentions***

Ajzen and Driver (1992) believe that will is the antecedent condition of behavior, will determines behavior, and the intensity of will directly affects the likelihood of behavior. Purchase intention refers to the possibility of consumers to buy a certain product, which is the psychological will of consumers subjectively generated, so consumers' purchase intention is used as a key indicator to predict consumers' purchase behavior. Zhu (1984) believed that consumers measure whether the object of purchase can meet their own needs before making a purchase, resulting in the idea of purchase, that is, consumers' purchase intention is the antecedent condition of consumers' purchase behavior. Zeithaml (1993) divided consumers' shopping intention into three dimensions: willingness to buy, highly likely to buy, and affirmative purchase. Han & Tian (2005) defined purchase intention as the possibility of consumers to buy a certain product. Feng (2006) pointed out that purchase intention is the basis of purchase behavior by summarizing the research on consumer purchase intention. On the basis of summarizing the research on purchase intention, according to the specific situation of E-commerce LIVE, this paper defines consumer purchase intention as the stickiness and preference of consumers in the live stream during the process of watching E-commerce LIVE, and the possibility that consumers are subjectively willing to stay in the live stream and buy the products or services they sell.

Kim and Fiore et al. (2007) pointed out that when consumers feel the enjoyment and pleasure of shopping and the self-participation when shopping is strong, it can produce a better online shopping experience, which can stimulate consumers' purchase intention, and consumers' online purchase experience can be improved by introducing product information in an all-round way. Diao Leiyu (2010) found that consumers' purchase intention is affected by the convenience, aesthetics and consumers' perceived usefulness of information on websites. Koufaris & Hampton-Sosa (2004) believed that consumer perceived trust can positively affect consumers' purchase intention. From the perspective of consumer experience, He & Zhou (2013) confirm that online shopping provides consumers with a better and stronger sense of experience, which can positively affect consumers' purchase intention by positively affecting the value of shopping experience. In the field of E-commerce LIVE, the research on consumers' purchase intention mainly focuses on the characteristics of E-commerce LIVE platform and live streaming host, the technical improvement of e-commerce websites, consumer interaction participation (such as online comments, bullet comments, etc.), and perceived usefulness, consumer trust, consumer loyalty and identity. The research on the characteristics of live streaming hosts points out that the professionalism, credibility and personal charm of live streaming host can significantly affect consumers' purchase intention. Yang & Zhang (2018) confirmed the relationship between the characteristics of "Internet celebrity" information sources and consumers' purchase intention by studying the relationship between the professionalism and attractiveness of Internet celebrities.

Zhang (2018) stated when studying the recommendation of self-media opinion leaders,

constructed an impact model on consumers' purchase intention, and divided the characteristics of self-media into five aspects: reputation, professionalism, homogeneity, user stickiness and product consistency, confirming that consumers' purchase intention is affected by the above five factors, and trust plays an intermediary role.

Meng et al. (2020) study confirmed that the credibility, professionalism, and interactivity of live broadcast Internet celebrities can make consumers have a stronger sense of identity with live broadcast, thereby promoting the generation of purchase intention. Wu (2020) study confirmed the rationality and accuracy of the model of live streaming host and consumer communication style - consumer quasi-social interaction perception - consumer purchase intention. Chen et al. (2002) based on SOR research confirmed that in the context of live streaming delivery, the entertainment, quality and informativeness of live streaming host language content affect consumers' perceived utilitarian value and perceived hedonic value to varying degrees, and then affect consumers' purchase intention.

### ***Cognitive Closure Need***

The need for cognitive closure was first named structural need by Kruglanski (1989). After repeated investigation and consideration, Webster and Kruglanski officially renamed structural need as cognitive closure need in 1994. Cognitive closure need describes the motivation and need of individuals to respond quickly to end this state when they are faced with difficult problems and chaotic and complex situations. After decades of systematic research, in 2004, Kruglanski defined it as an individual facing ambiguity in order to eliminate the stress and anxiety caused by the ambiguous state. Therefore, in order to eliminate ambiguity and uncertainty, those who need high-level cognitive closure are highly motivated to pursue certainty, even if there is a lack of definitive evidence to support their decisions, or the present is not the best time to make a decision, but they still prefer to give answers more actively and quickly; in contrast, those who need low-level cognitive closure are able to tolerate ambiguity and uncertainty, and in the face of ambiguity, they are not eager to eliminate this state immediately, but tend to collect more information and through in-depth analysis to support their decisions, and finally determine the answer.

In the study of cognitive closure needs, scholars usually measure the level of cognitive closure needs in the study and divide them into high-level cognitive closure needs and low-level cognitive closure needs and explore whether different levels of subjects will have the same effect and effect on the study. Existing research on cognitive closure needs mainly focuses on two aspects, which just fit the two meanings of cognitive closure needs. On the one hand, it is considered that the level of individual cognitive closure needs is a relatively stable variable used to describe the level of individual characteristics that can be measured by scales. Webster and Kruglanski (1994) designed and developed a cognitive closure needs scale, which divides cognitive closure needs into five aspects: discomfort with ambiguity, need for structure, and psychological closure. This scale, as the earliest scale used to measure

the level of individual cognitive closure needs, has been used many times by scholars at home and abroad. Domestic scholars Liu Xuefeng and Liang Junping further improved the Chinese scale of cognitive closure needs on the basis of this scale, verifying the rationality of the cognitive closure needs scale in the Chinese context. On the other hand, scholars believe that the level of cognitive closure needs can be temporarily changed in a short period of time, and the outside world changes environmental factors to increase the pressure felt by individuals, thereby increasing the level of consumer cognitive closure needs. It is by manipulating environment variables to affect the level of cognitive closure of individuals in the short term. Regarding the pre-factors that affect the level of cognitive closure needs, scholars have pointed out through research that environmental noise (Kruglanski & Webster, 1991) and time pressure (Webster & Kruglanski, 1998) can temporarily improve the level of individual cognitive closure needs, make individuals feel that the thinking they are doing in the current activities is boring, and can also affect individual decision-making behavior. Zhu Hong (2015) pointed out that the level of individual cognitive closure needs affects individual purchasing decisions, and those with high levels of cognitive closure need are more likely to make quick choices than those with low levels of cognitive closure need.

#### ***Cognitive Affective Systems Theory***

Research on cognitive affective system theory mainly focuses on medicine, psychology, education management and other fields, and has been introduced into the study of user information behavior in recent years. Cognitive affective system theory was first proposed by Mischel in 1973 to make up for the shortcomings of trait research. In 1995, Mischel and Shoda pointed out that cognitive affective system theory can predict the generation of individual behavior from the cognitive-affective level. When external stimuli activate individual cognitive or affective units, they will cause individual cognitive or affective responses, thereby affecting individual behavior. These two units also constitute an interactive system. Individuals process information from external situations to generate internal cognition. This cognitive stimulus then awakens individual emotions, and finally prompts individual behavior. The activation of one unit of the individual will awaken another unit, thereby affecting individual behavior. Therefore, based on the theory of cognitive-affective systems, a mechanism model of consumer purchase intention in the context of E-commerce LIVE can be constructed from the perspective of cognition-emotion.

#### ***Social Support Theory***

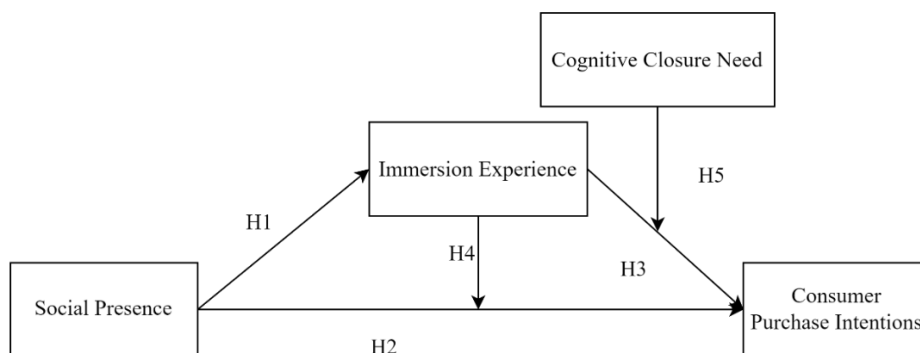
The theory of social facilitation was first put forward by Robert (1965), who pointed out through experiments that the presence of others has different effects on individual performance under different conditions. When individuals face simple and easy-to-complete tasks, the presence of others has a positive impact on their performance. When individuals face complex and unfamiliar tasks that are not easy to complete, the presence of others will have a negative impact on their performance. Social



facilitation theory describes that when an individual completes a certain job or makes a certain decision, the presence of others, whether real or virtual presence through communication media, can awaken the internal drive of the individual, make the individual feel the socialization scene psychologically, and produce an interpersonal impact effect, which will promote the growth of the quantity and quality of individual behavior and improve the efficiency of individual behavior. Academics believe that there are two paths for the impact of social facilitation theory on individual behavior. The first is the internal drive, in which the individual will notice the presence of others and think that others will also pay attention to themselves, so as to focus on their own actions, strengthening the individual's social drive, resulting in the emergence of social fueling effect. The second is guidance, in which the individual feels the presence of others and takes the behavior of others as its own imitation object, thus producing a guiding effect and a social fueling effect. The research on social facilitation theory focuses on psychology, marketing, online shopping and other fields. In the context of E-commerce LIVE, real-time and efficient interaction between consumers in the live stream can form a social shopping scene like offline shopping, allowing consumers to feel the presence of others psychologically. Purchasing decisions are relatively simple and easy to complete, so they can promote the generation of consumer behavior performance. Based on this, the influence mechanism model of social presence on consumer purchase intention in E-commerce LIVE can be used.

**Conceptual Framework**

Based on cognitive affective system theory and social facilitation theory, this paper introduces Immersion experience as a mediating variable, mainly explores the influence mechanism of social presence on consumers' purchase intention in the context of E-commerce LIVE, and introduces cognitive closure need as a moderating variable between Immersion experience and consumers' purchase intention.



**Picture 1: Conceptual Framework**

**Hypotheses**

H1: Social presence positively affects the Immersion experience.

H2: Social presence has a positive impact on consumer purchase intentions.

H3: Immersion experiences are influencing consumer purchase intentions.

H4: Immersion plays a mediating role in the influence of social presence on consumers' purchasing intention.

H5: The positive relationship between Immersion experience and consumer purchase intention is stronger in the case of high-level cognitive closure needs orientation than in the case of low-level cognitive closure needs.

## Methodology

This paper mainly uses literature research methods, questionnaire survey method and statistical analysis method to conduct research. On the basis of summarizing relevant research literature at home and abroad, it sorts out the research logic of this paper, constructs the research model of this paper, and combines the existing relevant scales to design the questionnaire items according to the research situation of this paper, and determines that the Likert scale is used for the questionnaire survey. After the questionnaire design is completed, the questionnaires will be distributed online to consumers who have watched E-commerce LIVE and purchased products or services, and relevant data will be collected. After excluding the mismatched and unqualified questionnaires, the data will be sorted out. Data analytics software such as SPSS will be used to test the research hypotheses, verify the hypotheses, and draw conclusions.

After the final recovery and sorting, a total of 363 questionnaires were recovered. After excluding the questionnaires and other invalid questionnaires that did not watch E-commerce LIVE and shopped, 321 valid questionnaires were obtained, with an effective collection rate of 88.43%.

In this study, the alpha coefficient of social presence was 0.84, the alpha coefficient of immersion experience was 0.811, the alpha coefficient of consumer purchase intention was 0.820, the alpha coefficient of cognitive closure need was 0.739, and the alpha coefficient of the overall questionnaire reached 0.919, all above 0.7, indicating that the reliability of the questionnaire designed in this study is good.

**Table 1:** Results of Reliability Analysis for Each Variable

Variable	Number of questions	Cronbach 's $\alpha$
Social Presence	9	0.843
Immersion Experience	5	0.811
Cognitive Closure Need	9	0.739
Consumer Purchase Intentions	5	0.820

## Results

This paper tests the hypothesis model through hierarchical regression analysis. When testing

the relationship between social presence and consumer purchase intention, that is, H2, the control variables such as gender, age, education, occupation and E-commerce LIVE shopping frequency are first put into the regression analysis, and then social presence is included, and consumer purchase intention is taken as the dependent variable. The normalization coefficient  $\beta$  of social presence on consumer purchase intention is 0.649 ( $p < 0.001$ ), indicating that social presence has a significant positive impact on consumer purchase intention. H2 Social presence positively affects consumer purchase intention.

Taking the consumer's purchase intention as the dependent variable, the control variables (gender, age, education, occupation, shopping frequency), social presence and immersion experience were put in sequence. As shown in model 6 in the table above, the intermediary variable immersion experience was included in the regression equation. After finding that immersion experience positively affected consumers' purchase intention ( $\beta = 0.542$ ,  $p < 0.001$ ), at this time, social presence still had a significant positive impact on consumers' purchase intention ( $\beta = 0.281$ ,  $p < 0.001$ ), and the coefficient was lower than before, so immersion experience played a partial mediating role in the impact of social presence on consumers' purchase intention. It is H4 immersion experience played a mediating role in the impact of social presence on consumers' purchase intention. Finally, using Process to verify the results, the confidence intervals of the total effect, direct effect and the mediating effect of the immersion experience do not include 0, and the conclusion is consistent with the above. According to the output of Process, the decomposition table of the total effect, direct effect and mediating effect is drawn, and it can be found that the mediating effect of the immersion experience accounts for 56.75%.

This paper uses hierarchical regression analysis to test H5, that is, the impact of immersion experience on consumer purchase intention is moderated by the need for cognitive closure, and the positive relationship between immersion experience and consumer purchase intention is stronger in the case of high-level cognitive closure need orientation than in the case of low-level cognitive closure need. Before conducting the moderation effect hypothesis test, the mediator variable immersion experience and the moderator variable cognitive closure need to be decentralized, and then the interaction terms of the two are obtained using computational variables for subsequent operation. After treatment, SPSS hierarchical regression analysis was used to test. Taking consumer purchase intention as the dependent variable, control variables (gender, age, education, occupation, shopping frequency), immersion experience, cognitive closure need, and the interaction between immersion experience and cognitive closure need were placed in sequence. The effect of immersion experience on consumer purchase intention was regulated by cognitive closure need ( $\beta = 0.082$ ,  $p < 0.05$ ). Therefore, this study hypothesizes that the influence of immersion experience on consumer purchase intention is mediated by the need for cognitive closure, and the positive relationship between immersion experience and consumer purchase intention is stronger in the case of high-level cognitive closure need orientation than

in the case of low-level cognitive closure need.

It can be seen from the data in the table above that the absolute fitting index  $X^2/df$  of the model is less than 3; the approximate error index RMSEA is less than 0.05; the relative fitting index CFI is greater than 0.9, NFI is greater than 0.9, IFI is greater than 0.9; the goodness of fit GFI is greater than 0.9, AGFI is greater than 0.9. Therefore, all the fitting indexes of the model in this paper meet the standards, the adaptation is ideal, and the structural validity is good.

**Table 2:** Structural model fitness parameters

Statistical tests	X <sup>2</sup> /df	RMSEA	GFI	NFI	TLI	CFI	AGFI	IFI	PGFI
Criteria for fit	<3	<0.05	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.5
Test result data	1.172	0.023	0.934	0.919	0.982	0.987	0.901	0.987	0.739

**Table 3:** Correlation Analysis

variable	1	2	3	4	5	6	7	8
Gender	1							
Age	-0.008							
Education	0.087	-0.198**						
Occupation	-0.053	0.415**	-0.234**					
Shopping Frequency	-0.123*	0.077	-0.096	0.086				
Social Presence	-0.033	0.098	0.001	-0.010	0.173**			
Immersion Experience	-0.050	0.128*	-0.025	-0.069	0.211**	0.707**		
Purchase Intention	-0.025	0.056	0.026	-0.072	0.233**	0.674**	0.752**	
Cognitive Closure Requirement	0.112*	-0.107	0.163**	-0.097	-0.098	0.160**	0.106	0.178**

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$  (two-tailed test)

It can be seen from the above table that social presence is significantly positively correlated with immersion experience ( $r = 0.707$ ,  $p < 0.01$ ) and consumer purchase intention ( $r = 0.674$ ,  $p < 0.01$ ), with H1 and H2 receiving preliminary support; immersion experience is significantly positively correlated with consumer purchase intention ( $r = 0.752$ ,  $p < 0.01$ ), and H3 is initially supported; cognitive closure needs are significantly positively correlated with social presence ( $r = 0.160$ ,  $p < 0.01$ ) and consumer purchase intention ( $r = 0.178$ ,  $p < 0.01$ ).

## Discussion

In this study, SPSS was used to process and analyze the data collected by the questionnaire, and to verify the hypotheses put forward. First, the invalid questionnaires were screened out, and the remaining 321 qualified questionnaires were processed in the first step. The items under the four

research variables were integrated, and their mean values represented the values of their respective variables. Secondly, the sample structure analysis and descriptive statistical analysis were carried out to test the reliability and validity of the questionnaire after understanding the basic situation of the samples. Next, the correlation analysis was carried out to determine the correlation between each variable, and the hypothesis test was started after the significant correlation between the variables was obtained through the correlation analysis. Finally, the hypothesis testing part is divided into three parts, namely the main effect - the positive impact of social presence on consumers' purchase intention and the intermediary effect of immersion experience, and the test of the need for adjustment effect of cognitive closure. The research found that all five research hypotheses in this paper are valid.

### **Conclusions**

The five research hypotheses put forward in this paper based on the influence mechanism and conditions of social presence on consumers' purchase intention are all supported, and the following conclusions are drawn: First, social presence positively affects consumers' purchase intention. According to the theory of social facilitation, with the increase of the number of people in the live stream and the strengthening of interaction, a highly three-dimensional real-time interactive social scene and shopping scene are created. Consumers feel a higher level of social presence, and psychologically feel the real presence of others. The resulting audience effect prompts their action efficiency to improve, so as to make purchasing decisions quickly.

In addition, consumers will therefore be more willing to stay in the live stream for a long time in order to further communicate and interact with the live streaming host and other consumers, enhance the emotional connection with them, and thus generate stronger user stickiness to the live stream. In the process of watching E-commerce LIVE, they learn about product information and listen to the recommendations of the live streaming host and the comments of other consumers, thereby improving the purchase probability of products sold in the live stream. Second, the immersion experience plays a mediating role in the impact of social presence on consumers' purchase intention. According to the theory of cognitive affective system, in the E-commerce LIVE context, the communication and interaction between consumers and live streaming hosts and other consumers in E-commerce LIVE makes consumers generate a high level of social presence and feel the significance of their interpersonal relationships with others. This external stimulus awakens consumers' cognitive responses, generating positive cognition. Positive cognition awakens consumers' emotional responses, causing consumers to experience the positive emotions of immersion.

At this time, consumers will be more immersed in the live broadcast, spend more time staying and respond more actively to the recommendations of live streaming hosts and other consumers, communicate and interact with them, and thus have a stronger willingness to buy the products they

recommend. Third, cognitive closure needs to play a moderating role in the positive impact of immersion experience on consumers' purchase intention. In the E-commerce LIVE context, cognitive closure requires the first stage of social presence to make consumers trust the live streaming host, and immersive experience makes consumers feel the companionship and pleasure brought by the virtual environment, that is, E-commerce LIVE. Compared with offline shopping, E-commerce LIVE is more uncertain and the situation is more ambiguous.

Therefore, high-level cognitive closure subjects are more likely to listen to the live streaming host and other consumers when facing E-commerce LIVE. Implicit recommendations from consumers can be made to quickly make purchasing decisions to eliminate this uncertainty and ambiguity. Therefore, when facing the recommendation of a live streaming host, they will choose to buy without much thought. In the second stage, those who need high cognitive closure will stick to their judgment in the first stage. Because they are relatively closed, they are less receptive to new information, so even if there is new information to prove that the product is not worth buying or there is a problem in the live stream, they will not change their position and still choose to buy. Therefore, the immersion experience under the adjustment of cognitive closure needs has a stronger positive impact on consumers' purchase intention.

## References

- Ajzen, I., & Driver, B. L. (1992). Application of the theory of planned behavior to leisure choice. *Journal of Leisure Research, 24*(3), 207–224.
- Animesh, A., Pinsonneault, A., Yang, S.-B., & Oh, W. (2011). An odyssey into virtual worlds: Exploring the impacts of technological and spatial environments on intention to purchase virtual products. *MIS Quarterly, 35*(3), 789–810.
- Biocca, F. (2001). Inserting the presence of mind into a philosophy of presence: A response to Sheridan and Mantovani & Riva. *Presence: Teleoperators and Virtual Environments, 10*(5), 546–556.
- Bulu, S. T. (2012). Place presence, social presence, co-presence, and satisfaction in virtual worlds. *Computers & Education, 58*(1), 154–161.
- Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. Jossey-Bass.
- Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology, 56*(5), 815–822.
- Cyr, D., Head, M., & Larios, H. (2007). Exploring human images in website design: A multi-method approach. *MIS Quarterly, 31*(2), 259–283.
- Fonner, K. L., & Roloff, M. E. (2012). Testing the connectivity paradox: Linking teleworkers' communication media use to social presence, stress from interruptions, and organizational

- identification. *Communication Monographs*, 79(2), 205–231.
- Ghani, J. A., Supnick, R., & Rooney, P. (1991). The experience of flow in computer-mediated and in face-to-face groups. In *Proceedings of the Twelfth International Conference on Information Systems* (pp. 229–237).
- Guo, Y., & Poole, M. S. (2009). Antecedents of flow in online shopping: A test of alternative models. *Information Systems Journal*, 19(4), 369–390.
- Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *American Journal of Distance Education*, 11(3), 8–26.
- Hassanein, K., & Head, M. (2007). Manipulating perceived social presence through the web interface and its impact on attitude towards online shopping. *International Journal of Human-Computer Studies*, 65(8), 689–708.
- Hoffman, D. L., & Novak, T. P. (1996). Marketing in hypermedia computer-mediated environments: Conceptual foundations. *Journal of Marketing*, 60(3), 50–68.
- Kovanović, V., Joksimović, S., Gašević, D., Siemens, G., & Hatala, M. (2015). What public media reveals about MOOCs: A systematic analysis of news reports. *British Journal of Educational Technology*, 46(3), 510–527.
- Kruglanski, A. W. (1989). *Lay epistemics and human knowledge: Cognitive and motivational bases*. Plenum Press.
- Lu, H., & Bai, Y. (2017). Factors influencing consumers' engagement in online travel agencies: An empirical investigation. *Tourism Management Perspectives*, 23, 59–70.
- Molinillo, S., Aguilar-Illescas, R., Anaya-Sánchez, R., & Vallespín-Arán, M. (2018). Exploring the impacts of interactions, social presence and emotional engagement on active collaborative learning in a social web-based environment. *Computers & Education*, 123, 41–52.
- Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review*, 102(2), 246–268.
- Novak, T. P., Hoffman, D. L., & Yung, Y.-F. (2000). Measuring the customer experience in online environments: A structural modeling approach. *Marketing Science*, 19(1), 22–42.
- Skadberg, Y. X., & Kimmel, J. R. (2004). Visitors' flow experience while browsing a website: Its measurement, contributing factors and consequences. *Computers in Human Behavior*, 20(3), 403–422.
- Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology*, 67(6), 1049–1062.